# Draft Appendix E

## Randolph Township Wind/Solar Energy System Zoning Regulations

### Definitions

**Small Energy System**
Is a renewable energy system to provide for energy needs, designed to serve single subject development or property. The purpose of a small energy system is to be an accessory use of the property. A small energy system should not have the ability to generate more than 100kW per day of the subject property or units of a development.

**Small Solar Energy System**
Any solar collector or other solar energy device, or any structural design feature whose primary purpose is to provide for the collection, storage and distribution of solar energy for space heating or cooling, for water beating or for electricity that may be mounted on a building or on the ground and is not the primary use of the property.

**Small Wind Energy System**
A wind energy system consists of a wind turbine, a tower, and associated controls or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-site consumption of utility power. The purpose of a small energy system is to be an accessory se of the property.

**Solar Energy**
Means radiant energy (direct, diffuse, and reflected) received from the sun.

**Solar Energy Dual Purpose**
Means solar energy is collected to create energy from structures that are generally permitted, examples could be fences or walls. This would include exterior lighting for patios and walkways. Duel purpose structures should look primary like a fence, wall or light fixture and not the opposite for the purpose of generating electricity while blending into the landscape. The appearance of the structure should be commonly recognizable with the production of electricity interwove11 or embedded into the structure not to dominate the appearance.

**Wind Energy Turbine**
Mechanical equipment which is used to convert kinetic energy of the wind through the rotation of the mechanical equipment to facilitate the generation of electricity.

# SECTION 001.00 SMALL WIND ENERGY SYSTEMS

## SECTION 001.01 PURPOSE

Small energy systems shall be permitted in all zoning districts, in accordance with the requirements of this Section.

## SECTION 001.02 ALLOWABLE NUMBER OF TOWERS AND WIND TURBINES

### A. Towers

No more than one wind energy tower may be located on any single site, in accordance with this Section, unless otherwise stipulated in this Resolution.

### B. Wind Turbines

Any number of wind energy system turbines may be in operation on a single site, in accordance with this Section.

## SECTION 001.03 HEIGHT

The total height of small wind energy systems is measured as the vertical distance from the ground level to the tip of a wind generator blade when the tip is at its highest point, and shall not exceed the following maximum height requirements:

A. Wind Towers

1. Properties less then 1/2 acre in size – The distance from the property line must be1.2 times the total height.
2. Properties between 1/2 acre and one acre in size - The distance from the property line must be1.2 times the total height.
3. Properties greater than (1) acre to 2-1/2 acres - The distance from the property line must be1.2 times the total height.
4. Properties greater than 2-1/2 acres to 5 acres - The distance from the property line must be1.2 times the total height.
5. Properties greater than 5 acres in size – (maximum170 feet), The distance from the property line must be1.2 times the total height.
6. Properties within 10,000 feet of an Airport must comply with FAA height standards and regulations.

B. Attachment to existing buildings and towers

1. Building

A. Wind turbine(s) may be affixed to the building or the roof, providing that:

a. The total height of the wind turbine is less than 20 feet above the highest point of the building.

b. The base of the wind turbine cannot be seen from the road right-of-way.

2. Towers

A wind turbine may be attached to an existing tower, providing that:

a. The tower is designed to accommodate the wind turbine.

b. The tower is in compliance with Sections 001.05.A and 001.006.B

**SECTION 001.04 LOCATION**

A. A wind energy system shall only be located in the rear yard portion of any lot.

Exception is when the wind system is attached to a building the base of which can not be viewed from any roadway.

B. Tower Set backs

1. Shall be located at least 1.2 times its height from any public road right-of way.

2. Shall be located at least 1.2 times its height from any overhead utility lines, except those lines directly serving the subject property.

3. Shall be located at least 1.2 times its height from all property boundaries.

4. Guy Wire Anchors Set backs

a. If guy wires are utilized as part of the tower design, then the guy wire anchors shall be placed at least 50 feet from the any abutting property boundaries.

b. The minimum distance a wind turbine may be from the property boundaries, if it is located on a building, must be 1.2 times the distance that is equal to the total height of the wind turbine from the ground.

**SECTION 001.05 LIABILITY**

A. Property owner shall be prepared to demonstrate proof of public liability insurance.

**SECTION 001.06 VARIANCES**

A. Wind Turbines may be located in the front or side yard of primary structure if because of pre-existing geography, vegetation or built environment would preclude the use of wind power in the rear of the primary structure.

B. To request more than one tower per site development.

**SECTION 001.07 FENCING**

A. The base of the tower must be designed so it is not climbable for a distance of 15 feet, as measured from the ground.

B. All access doors to wind turbines and electrical equipment shall be locked to prevent entry by non-authorized persons.

**SECTION 001.08 ELECTRICAL INTERFERENCE**

The small wind energy system shall not cause any radio, television, microwave, or navigation interference. If a signal disturbance problem is identified, the applicant shall correct the problem within 90 days of being notified of the problem.

**SECTION 001.09 NOISE**
The wind energy system shall not exceed the sound level (decibels) specified in Schedule 001.09.1 when measured at the property line.

**Schedule 001.09.1**
**Maximum Permitted Sound Levels (Decibels) for small wind energy system**

| Octave band, cycles/second | sound level measured at the property lines cannot exceed the following |
|---|---|
| 0-75 | 72 |
| 75-150 | 67 |
| 150-300 | 59 |
| 300-600 | 52 |
| 600-1200 | 40 |
| 1200-2400 | 46 |
| 2400-4800 | 34 |
| Over 4800 | 32 |

Octave band, cycles/second sound level measured at the property lines.
All towers shall be painted a non-contrasting gray, blue, white, green or similar color, minimizing its visibility, unless otherwise required by the Federal Aviation Administration (FAA). The applicant has the responsibility of determining the applicable FAA regulations and securing the necessary approvals. Copies of letters must be included as part of the application process.

**SECTION 001.10 LIGHTING**
Except as required by law, a tower shall not be illuminated and lighting fixtures or signs shall not be attached to the tower. If lighting is required by the FAA regulations, white strobe lights shall not be permitted at night unless FAA permits no other alternatives. No lighting shall be constructed, placed or maintained in a manner that will constitute a nuisance to any surrounding property and shall in no way impair safe movement of traffic on any street or highway.

**SECTION 001.11 ADVERTISING**
No advertising is permitted anywhere on the facility, with the exception of signage being utilized for product identification and warnings.

**SECTION 001.12 WARNINGS**

A. A clearly visible warning sign concerning voltage must be placed at the base of all pad-mounted transformers and substations.

B. Visible, reflective, colored objects, such as flags, reflectors, or tape shall be placed on the anchor points of guy wires and along the guy wires up to a height of ten feet from the ground.

**SECTION 001.13 MAINTENANCE**

A. The design and location of the wind energy system shall ensure that all maintenance can be conducted from the installation site.

B. A small wind energy system that is not functional shall be repaired by the owner or removed.

C. When a system reaches the end of its useful life and can no longer function, the owner of the system shall remove the system with 120 days of the day on which the system last functioned. The owner is solely responsible for removal of the system and all costs, financial or otherwise, of system removal.

D. Any small wind energy system that is not operated on a functional basis for a period of six (6) consecutive months shall be deemed abandoned.

**SECTION 001.14 SAFETY FEATURES**

A. The small wind energy system turbine shall be required to have an automatic over speed control to render the system inoperable when the winds are in excess of the speed the system is designed to accommodate.

B. The small wind energy system shall be required to have a manually operable method to render the system inoperable in the event of a structural or mechanical failure of any part of the system.

**SECTION 001.15 BLADE CLEARANCES**

A. The clearance or the distance between the blades of a wind turbine and the blades of another wind turbine shall be no less than 10 feet.

B. The clearance or the distance between the blades of a wind turbine and the ground shall be no less than 15 feet.

# SECTION 002.00 SOLAR ENERGY SYSTEMS

**SECTION 002.01 PURPOSE**
Small solar systems shall be permitted in all zoning districts, in accordance with the requirements of this Section.

**SECTION 002.02 ALLOWABLE NUMBER OF PANELS**

**A. Solar Panels**

Any number of solar panels may be in operation on a single site, in accordance with this Section.

**SECTION 002.03 HEIGHT**

A. Solar panels shall comply with the maximum permitted height of the zoning district.

B. Attachment to existing buildings and towers

1. Building

a. Solar panels shall comply with the maximum permitted height of the zoning district.

**SECTION 002.04 LOCATION**
A. A solar energy system shall only be located in the rear yard portion of any lot.

Exception is when solar energy system is attached to a building the base can not be viewed from any roadway. Another exception would be for duel purpose solar collectors. See solar energy duel purpose definition.

B. It is the property owner's responsibility to situate any solar collector so that a neighbor's trees or buildings –now or in the future, or any time of the year do not block access to the sun.

**SECTION 002.05 VARIANCES**

A. Solar System may be located in the front or side yard of primary structure if because of pre-existing geography, vegetation or built environment would preclude the use of solar power in the rear of the primary structure.

**SECTION 002.6 MAINTENANCE**

A. When a system reaches the end of its useful life and can no longer function, the owner of the system shall remove the system with 120 days of the day on which the system last functioned. The owner is solely responsible for removal of the system and all costs, financial or otherwise, of system removal.

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